Claims

1. A pneumatic motor comprising a piston sized to be received in a cylinder, the piston includes an intermediate section, a connecting rod extending away from the intermediate section to engage a crank shaft, and an actuator extending away from the intermediate section to cyclically engage a valve to allow compressed fluid into the cylinder during a power stroke of the piston, the intermediate section having an annular groove and a seal positioned in the groove to creates a fluid tight seal with the cylinder during the power stroke, and the intermediate section further including notched exhaust vents positioned to temporarily break the fluid tight seal during an exhaust stroke of the piston.

2. The pneumatic motor of claim 1, wherein:

the valve includes a valve stem positioned in an intake chamber in communication with the cylinder, the valve stem having a head protruding into the cylinder and outwardly flanged tail that engages an o-ring to create a fluid tight seal; and

the actuator includes a profile defined to push the head of the valve stem into the intake chamber to brake the fluid tight seal of the flanged tail and o-ring and allow compressed fluid contained in the intake chamber to enter the cylinder.

3. The motor of claim 2, wherein the exhaust vents are defined such that the fluid tight seal between the piston and the cylinder is broken during the exhaust stroke of the piston such that compressed fluid in the cylinder is permitted to vent during the exhaust stroke of the piston.

4. The motor of claim 1, wherein the actuator includes a rigid section extending away from the intermediate section to a tip and includes a flexible section that extends towards the intermediate section, the flexible section has a profile that engages the valve.

5. The motor of Claim 4, wherein the flexible section has an increasing flexibility traveling from the tip towards the intermediate section such that as a pressure of the compressed fluid decreases, the actuator opens the valve towards the initial engagement with the valve.

6. The motor of Claim 1, wherein the actuator includes a flexible section that extends away from the intermediate section to a tip, the flexible section has a profile that engages the valve.

7. The motor of Claim 6, wherein the flexible section has a decreasing flexibility traveling from the tip towards the intermediate section having such that as a pressure of the compressed fluid decreases, the actuator opens the valve towards the end of the actuator engagement with the valve.

8. The motor of Claim 1, wherein the intermediate section includes a notch such that the annular groove is opened to a region defined by the cylinder which is below the intermediate section.

9. A piston for use in a pneumatic motor, the piston comprising:

a intermediate section that has an annular groove, a seal positioned in said annular groove that creates a fluid seal against a cylinder defined by the pneumatic motor when the piston is

moving in a power stroke, and the intermediate section further includes exhaust vents positioned to temporarily open the fluid seal when the piston is moving in a exhaust stroke,

a rigid connecting rod extending away from the intermediate section to engage a crank shaft defined by the pneumatic motor; and

an actuator extending away from the intermediate section and having a means to engage and temporarily open a valve for a predetermined period of time, the valve being defined by the pneumatic motor as a means to prevent compressed fluid into the cylinder.

10. The piston of claim 9, wherein the actuator includes a flexible portion having a profile defined to engage and temporarily open said valve for a predetermined portion of the power stroke.

11. The piston of claim 10, wherein the actuator is defined as having a rigid portion extending away from the intermediate section to a tip and a flexible section extending away from the tip towards the intermediate section, the flexible section having an increasing flexibility traveling from the tip towards the intermediate section such that the flexible section opens the valve more towards initial engagement with the valve than towards end of engagement.

12. The motor of Claim 9, wherein the actuator is defined as having a flexible section that extends away from the intermediate section to a tip, the flexible section has a decreasing flexibility traveling from the tip towards the intermediate section such that the flexible section opens the valve more towards end of the engagement with the valve than towards initial engagement.

13. The motor of Claim 9, wherein the valve includes a valve stem having a head section and tail section, the tail section forming a fluid seal within an intake chamber preventing compressed fluid from traveling from the intake chamber to the cylinder and the head section positioned in the cylinder such that the actuator engages the head section for a predetermined portion of the power stroke and during such engagement moves the valve stem such that the fluid seal formed by the tail section in the intake chamber is broken to permit compressed air into the cylinder.

14. The motor of Claim 9, wherein the intermediate section includes a notch such that the annular groove is opened to a region defined by the cylinder which is below the intermediate section.

15. A piston for use in a motor, wherein the motor includes at least a cylinder for receiving said piston, a crank shaft and a valve for preventing fluid from entering the cylinder, the piston comprising:

a intermediate section that has an annular groove to accommodate a seal that creates and maintains a fluid tight seal against an interior wall defined by the cylinder, said fluid tight seal is maintained during a portion of a power stroke defined by a cyclic motion of the piston in operation, and the intermediate section further includes exhaust vents positioned to temporarily open the fluid tight seal during a portion of an exhaust stroke defined by the cyclic motion of the piston and a portion of the power stroke;

a connecting rod extending in a first direction away from the section to engage said crank shaft; and

an actuator extending in a second direction away from the section and having a flexible section to engage and open said valve for a portion of the power stroke that includes at least said portion of the power stroke when the fluid seal is created and maintained.

16. The piston of claim 15, wherein the actuator is defined as having a rigid portion extending away from the intermediate section to a tip and the flexible section extending away from the tip towards the intermediate section, the flexible section having an increasing flexibility traveling from the tip towards the intermediate section such that the flexible section opens the valve more towards initial engagement with the valve than towards end of engagement.

17. The motor of Claim 15, wherein the actuator is defined as having the flexible section that extends away from the intermediate section to a tip, the flexible section has a decreasing flexibility traveling from the tip towards the intermediate section such that the flexible section opens the valve more towards end of the engagement with the valve than towards initial engagement.

18. The motor of Claim 15, wherein the valve includes a valve stem having a head section and tail section, the tail section forming a fluid seal within an intake chamber preventing compressed fluid from traveling from the intake chamber to the cylinder and the head section positioned in the cylinder such that the actuator engages the head section for a predetermined portion of the power stroke and during such engagement moves the valve stem such that the fluid

seal formed by the tail section in the intake chamber is broken to permit compressed air into the cylinder.

19. The motor of Claim 16, wherein the intermediate section includes a notch such that the annular groove is opened to a region defined by the cylinder which is below the intermediate section.

20. The motor of Claim 17, wherein the intermediate section includes a notch such that the annular groove is opened to a region defined by the cylinder which is below the intermediate section.